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Acute Coronary Syndromes

MOBILIZATION OF ENDOTHELIAL PROGENITOR CELLS IN ACUTE CARDIOVASCULAR EVENTS: TIME-COURSE AFTER ACUTE MYOCARDIAL INFARCTION AND STROKE

Poster Contributions
Poster Hall B1
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Session Title: Fundamental Observations from Clincial Practice in ACS
Abstract Category: 1. Acute Coronary Syndromes: Basic
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Background: The mobilization pattern of endothelial progenitor cells (EPCs) after an acute ischemic event, and their functionality, are largely unknown. We aimed to characterize and compare the mobilization of EPCs and CECs following acute myocardial infarction (AMI) or atherothrombotic stroke, and to determine the relationship between these cell counts and plasma concentrations of vascular cell adhesion molecule (VCAM-1) and von Willebrand factor (VWF) as surrogates of endothelial damage and inflammation. In addition, we assessed whether EPCs behave like proper endothelial cells.

Methods: We included 150 patients with AMI or atherothrombotic stroke and 145 controls. EPCs [CD45-,CD34+,KDR+,CD133+], circulating endothelial cells (CECs) [CD45-,CD146+,CD31+], VWF, and VCAM-1 were measured in controls (baseline only) and in patients within 24 hours (baseline) and at 7, 30, and 180 days.

Results: In AMI patients, EPCs and CECs were higher than in controls (201.0/mL vs. 57.0/mL; $p<0.01$ and 181.0/mL vs. 62.0/mL; $p<0.01$). In stroke patients, EPCs and not CECs were higher than in controls (90.0/mL vs. 37.0/mL; $p=0.01$; 105.0/mL vs. 71.0/mL; $p=0.11$). EPCs peaked at 30 days post-AMI (201.0/mL vs. 369.5/mL; $p<0.01$), as did VCAM-1 (573.7 ng/mL vs. 701.8 ng/mL; $p<0.01$). At 30 days after stroke, however, there was a peak in VCAM-1 (628.1/mL vs. 869.1/mL; $p<0.01$) but no significant change in EPCs (90/mL vs. 78/mL; $p<0.34$). At 180 days after any acute event, CECs decreased with respect to baseline. Cultured EPCs from controls and AMI patients showed endothelial phenotypic characteristics and exhibited functional differences in adhesion and Ca^{2+} influx but not in proliferation and vasculogenesis.

Conclusion: EPC mobilization and VCAM-1 levels in AMI patients peaked at 30 days after the ischemic event; in stroke patients, VCAM-1 patterns were similar to AMI patients but EPCs did not increase. EPCs had a mature endothelial capability when cultured.